

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

We Claim:

1. (Currently Amended) A light homogenizing optical sheet, comprising: a ~~planar~~
substantially constant thickness sheet made of transparent material with ~~parallel~~ front and
back surfaces, each said front and back surface including a microlens array formed thereon,
said microlens array each including a plurality of non-hemispherical microlenses each aligned
and registered with a non-hemispherical microlens on an opposite said front and back
surfaces, said ~~planar~~ optical sheet having a sufficient thickness so that said microlenses on
opposite said front and back surfaces are separated by a distance substantially equal to the
focal length of said microlenses.

2. (Currently Amended) The optical sheet as recited in Claim 1, wherein said ~~planar~~ optical
sheet ~~includes two parallel half sheets laminated together~~ is planar.

3. (Currently Amended) The optical sheet as recited in Claim 1, wherein the centers of said
microlenses on said front surface and said back surface are transversely aligned along the
sheet.

4. (Currently Amended) The optical sheet as recited in Claim 3 ~~1~~, wherein the pitch of the
microlens array on said ~~planar~~ front and said back surfaces of the optical sheet includes two
parallel half sheets laminated together are non-equal.

1
2 5. (Currently Amended) The optical sheet as recited in Claim 2 1, further including a
3 ~~common substrate disposed between said half sheets~~ reflective surface disposed at a distance
4 of half the focal length of said microlenses from the front surface, such that said front surface
5 acts as the said back surface upon reflection of light illuminating the front surface, enabling
6 the light homogenizing optical sheet to be a reflective light homogenizing optical sheet.

7
8 6. (Canceled)

9
10 7. (Currently Amended) The optical sheet as recited in Claim 1, wherein said ~~planar~~ optical
11 sheet is made of flexible material.

12
13 8. (Currently Amended) ~~A light homogenizing~~ The optical sheet as recited in Claim 1,
14 wherein said optical sheet is comprising: a non-planar such that each microlens is sheet made
15 of transparent material with parallel front and back surfaces, each said front and back surface
16 including a microlens array formed thereon, said microlens array each including a plurality
17 microlenses each aligned and registered on the radius of curvature of said sheet.

18
19 9. (Currently Amended) A light homogenizing optical sheet comprising a ~~planar~~
20 substantially constant thickness sheet made of transparent material with ~~parallel~~ front and
21 back surfaces, each said front and back surface including a microlens array formed thereon,
22 said microlens array each including a plurality of non-hemispherical microlenses each
23 registered with a non-hemispherical microlens on opposite said front and back surfaces such

1 that exit cone chief ray angle is dependent on position across the sheet, said microlenses on
2 opposite said front and back surfaces being separated by a distance of the sheet thickness
3 substantially equal to the focal length of said microlens.
4

5 10. (Currently Amended) The optical sheet as recited in Claim 9, further including a second
6 microlens array surface having non-equal pitch, as compared to the front microlens array
7 surface pitch, such that the lenslet centers of both front and back surfaces are aligned
8 ~~substantially near the center of the active sheet, yet lenslet centers near the edge of the active~~
9 ~~sheet exhibit transverse offsets of up to one lenslet spacing~~ with a specific transverse offset at
10 a specific location within the plane of the sheet.
11

12 11. (Canceled)
13

14 12. (Original) The optical sheet as recited in Claim 9, further including a second microlens
15 array surface having substantially equal pitch, as compared to the front microlens array
16 surface pitch, such that the lenslet centers of both front and back surfaces are aligned with an
17 offset of up to one lenslet spacing across the sheet.
18

19 13-19. (Canceled)
20

21 20. (New) An illumination system comprising: an array of one or more light-emitting
22 sources located in a source plane; an optical sheet, separated from the source array by a first
23 propagation distance; and an illumination plane separated from said optical sheet by a second

1 propagation distance, so as to provide substantially uniform intensity output profile, within
2 the illuminated area, versus position across said illumination plane, wherein the said optical
3 sheet is a light homogenizing optical sheet, comprising a substantially constant thickness
4 sheet made of transparent material with front and back surfaces, each said front and back
5 surface including a microlens array formed thereon, said microlens array each including a
6 plurality of non-hemispherical microlenses each aligned and registered with a non-
7 hemispherical microlens on an opposite said front and back surfaces, said optical sheet
8 having a sufficient thickness so that said microlenses on opposite said front and back surfaces
9 are separated by a distance substantially equal to the focal length of said microlenses.

10
11 21. (New) The illumination system as recited in Claim 20, wherein the optical sheet is a
12 tailored optical sheet, wherein the aligned and registered microlens arrays on said front and
13 back surfaces have non-equal pitch, such that exit cones angles are dependent on position
14 across the optical sheet and are allowed to overlap substantially at an illumination plane.

15
16 22. (New) The illumination system as recited in Claim 20, wherein the optical sheet is a
17 tailored optical sheet, wherein the registered microlens arrays on said front and back surfaces
18 have equal pitch and are transversely aligned, such that exit cones angles exhibit a constant,
19 yet non-normal, exiting angle versus position across the optical sheet.

20
21 23. (New) The illumination system as recited in Claim 20, further including: an optical
22 system disposed between said source plane and said optical sheet so as to collimate said
23 sources of the source array; and an optical system disposed between said optical sheet and

1 said illumination plane so as to condense a substantially top-hat intensity profile versus
2 position across the plane of said illumination plane.

3
4 24. (New) An illumination system comprising: an array of one or more light-emitting
5 sources located in a source plane; a first optical sheet, separated from the source array by a
6 first propagation distance; a first illumination plane separated from said first optical sheet by
7 a second propagation distance; a second optical sheet located at said first illumination plane;
8 and a second illumination plane separated from said first illumination plane, so as to provide
9 substantially uniform intensity output profile, within the illuminated area, versus position
10 across said first illumination plane and to provide substantially uniform intensity output
11 profile versus position across said second illumination plane as well as versus angle within
12 the illuminated area of said second illumination plane, wherein the said optical sheets are
13 light homogenizing optical sheets, each comprising a substantially constant thickness sheet
14 made of transparent material with front and back surfaces, each said front and back surface
15 including a microlens array formed thereon, said microlens array each including a plurality of
16 non-hemispherical microlenses each aligned and registered with a non-hemispherical
17 microlens on an opposite said front and back surfaces, said optical sheet having a sufficient
18 thickness so that said microlenses on opposite said front and back surfaces are separated by a
19 distance substantially equal to the focal length of said microlenses.

20
21 25. (New) The illumination system as recited in Claim 24, wherein at least one optical sheet
22 is a tailored optical sheet, wherein the aligned and registered microlens arrays on said front
23 and back surfaces have non-equal pitch, such that exit cones angles are dependent on position

1 across the optical sheet and are allowed to overlap substantially at an illumination plane.

2
3 26. (New) The illumination system as recited in Claim 24, wherein at least one optical sheet
4 is a tailored optical sheet, wherein the registered microlens arrays on said front and back
5 surfaces have equal pitch and are transversely aligned, such that exit cones angles exhibit a
6 constant, yet non-normal, exiting angle versus position across the optical sheet.

7
8 27. (New) The illumination system as recited in Claim 24, further including: an optical
9 system disposed between said source plane and said first optical sheet so as to collimate said
10 sources of the source array; an optical system disposed between said first optical sheet and
11 said second optical sheet so as to condense a substantially top-hat intensity profile versus
12 position across the plane of said second optical sheet; and an optical system disposed
13 between said second optical sheet and said second illumination plane so as to provide a
14 substantially top-hat intensity profile versus position across said second illumination plane, as
15 well as versus angle α_3 within the illuminated area.

16
17 28. (New) The illumination system as recited in Claim 27 wherein the tiling patterns of the
18 first light homogenizing optical sheet and the second light homogenizing optical sheet are not
19 the same, such that a uniform top-hat intensity profile exhibiting x/y plane shape due to the
20 tiling pattern of the light homogenizing sheet in plane x_2 is formed at plane x_3 , while the
21 output exit cone shape emanating from plane x_3 exhibits shape due to the tiling pattern of the
22 light homogenizing sheet in plane x_1 .

1 29. (New) The reflective optical sheet as recited in Claim 5, further including an array of
2 one or more light-emitting sources located in a source plane, and an optical system, prior to
3 the sheet, so as to form an illumination system capable of providing top-hat uniformity at an
4 illumination plane.

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23